METRUM CRYOFLEX

Thermodynamic charactristics of Metrum Cryoflex cryoprobes - in vitro test report

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R&D department Metrum CryoFlex

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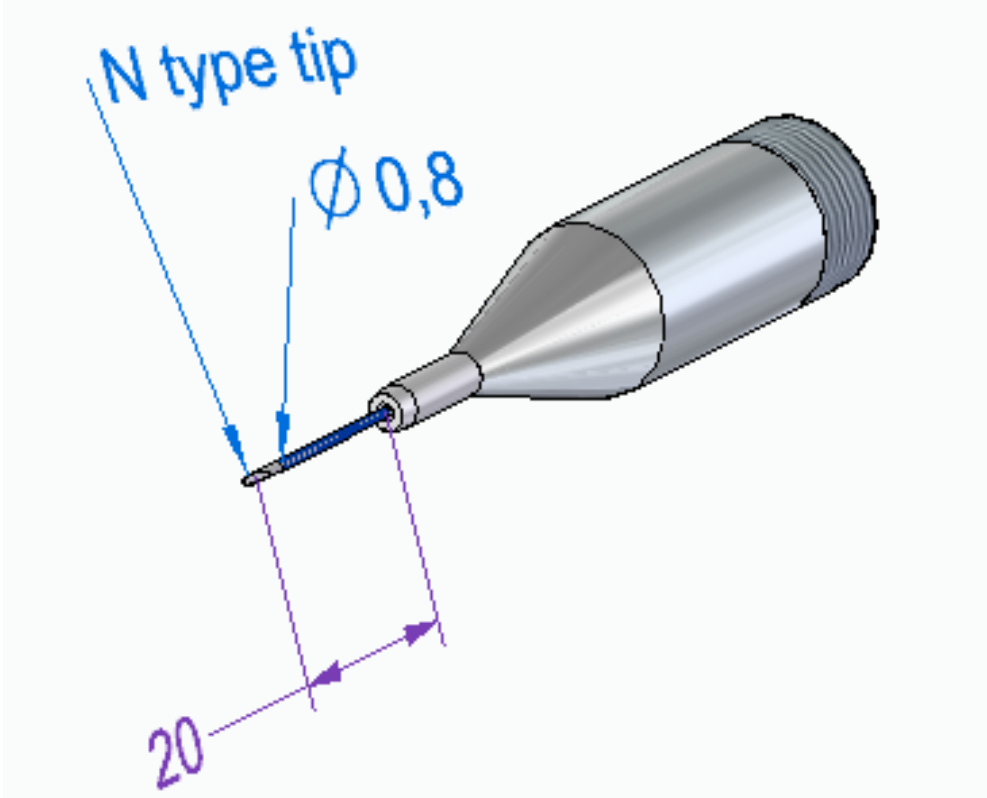
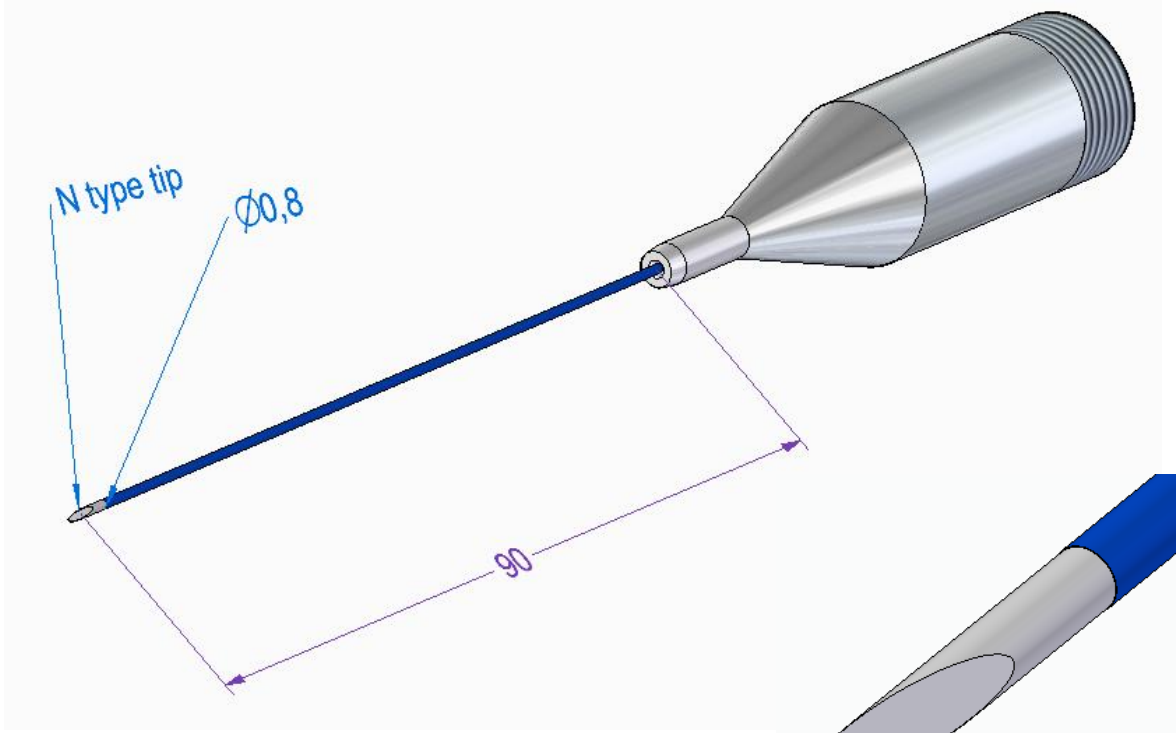
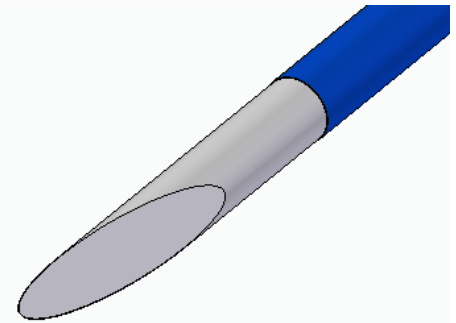
different type of cryoablation probes

∅ 0,8mm /L:20mm/needle tip



∅ 0,8mm /L:20mm/needle tip





Freezing tip: 5mm

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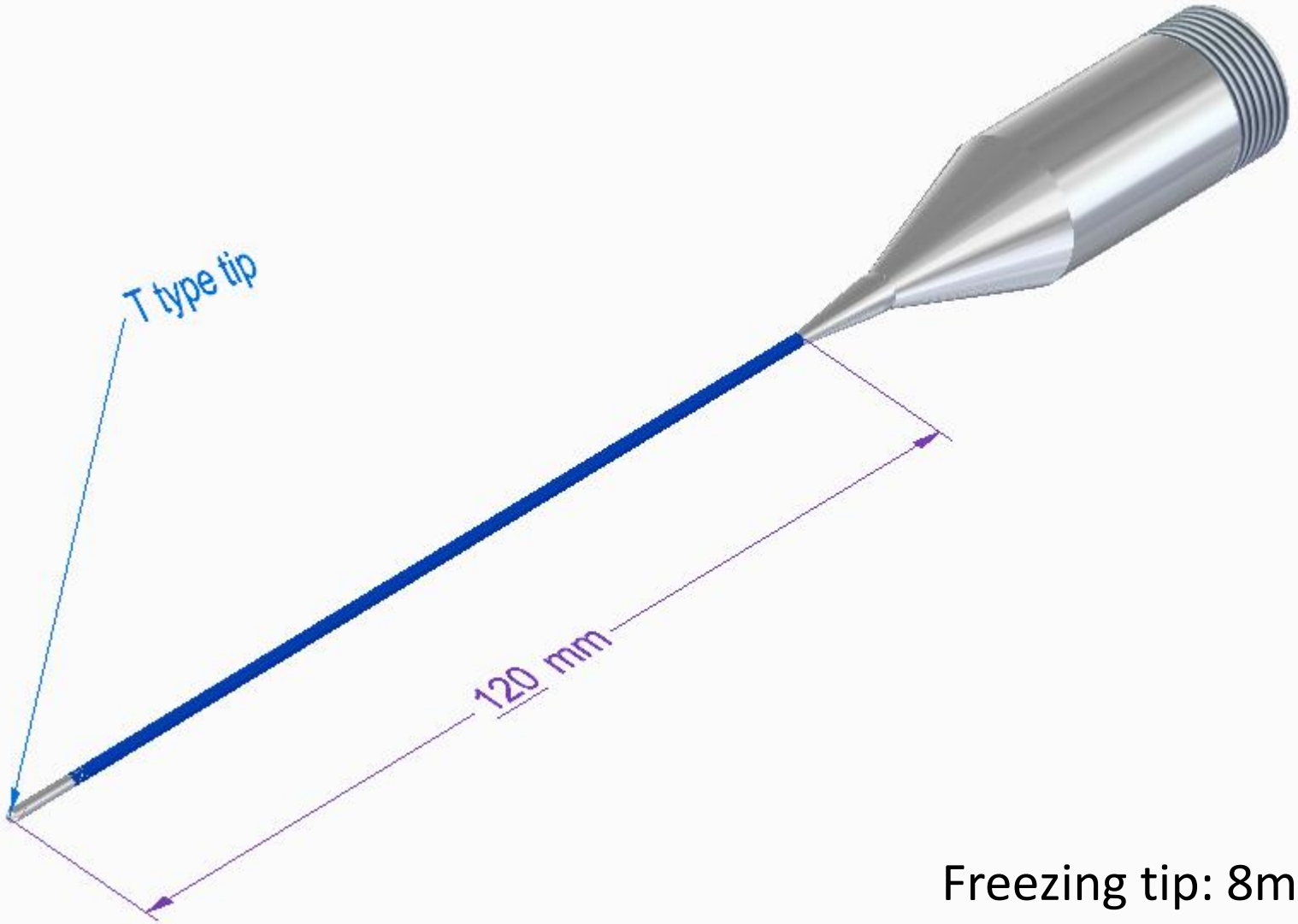
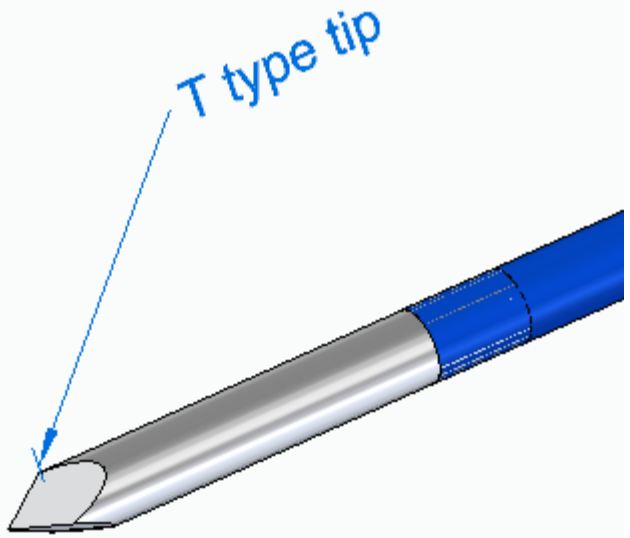
∅ 1,3/L: 120mm/radius or triangular tip





Freezing tip: 8mm

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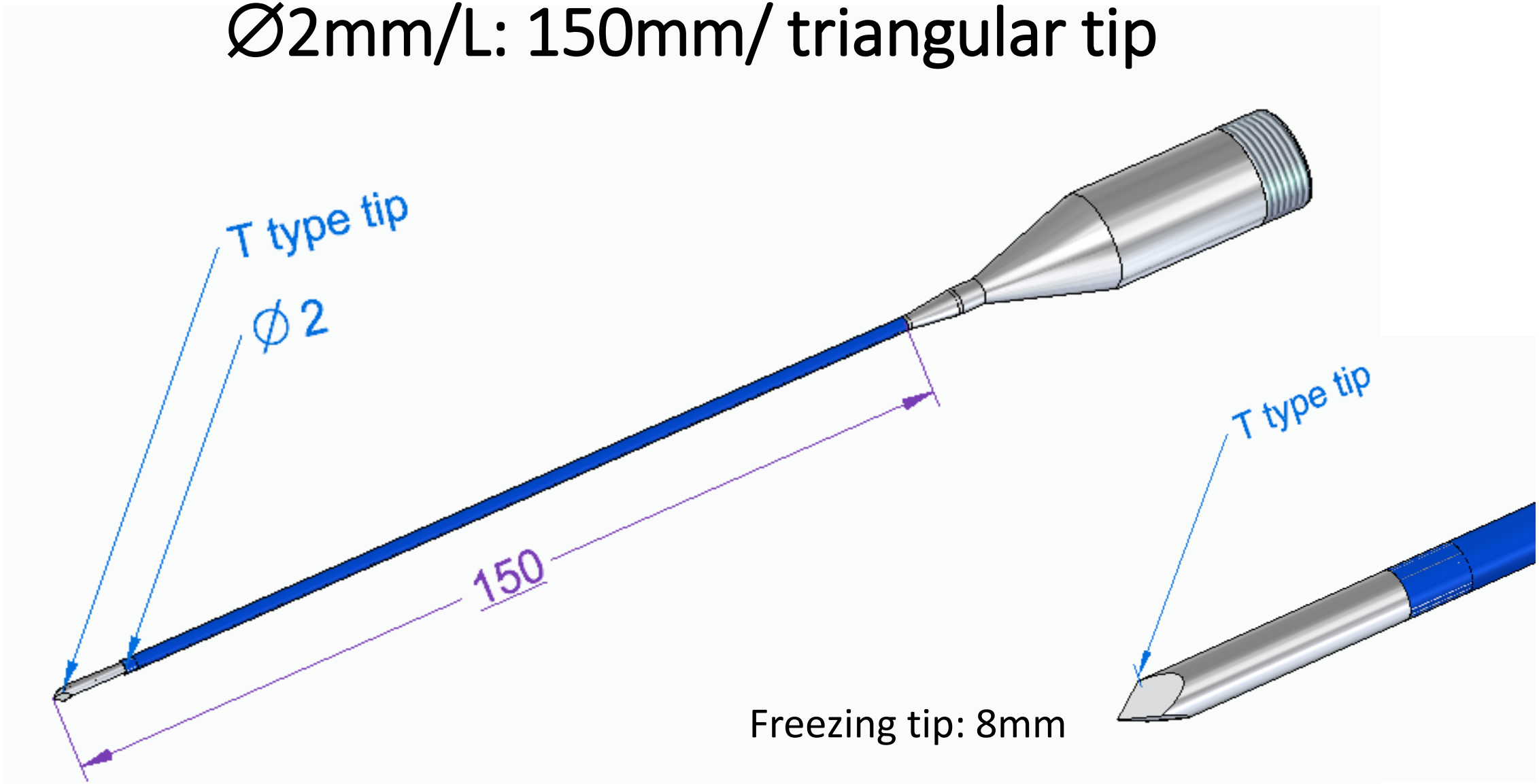
Ø2mm/L: 150mm/ triangular tip



Freezing tip: 8mm

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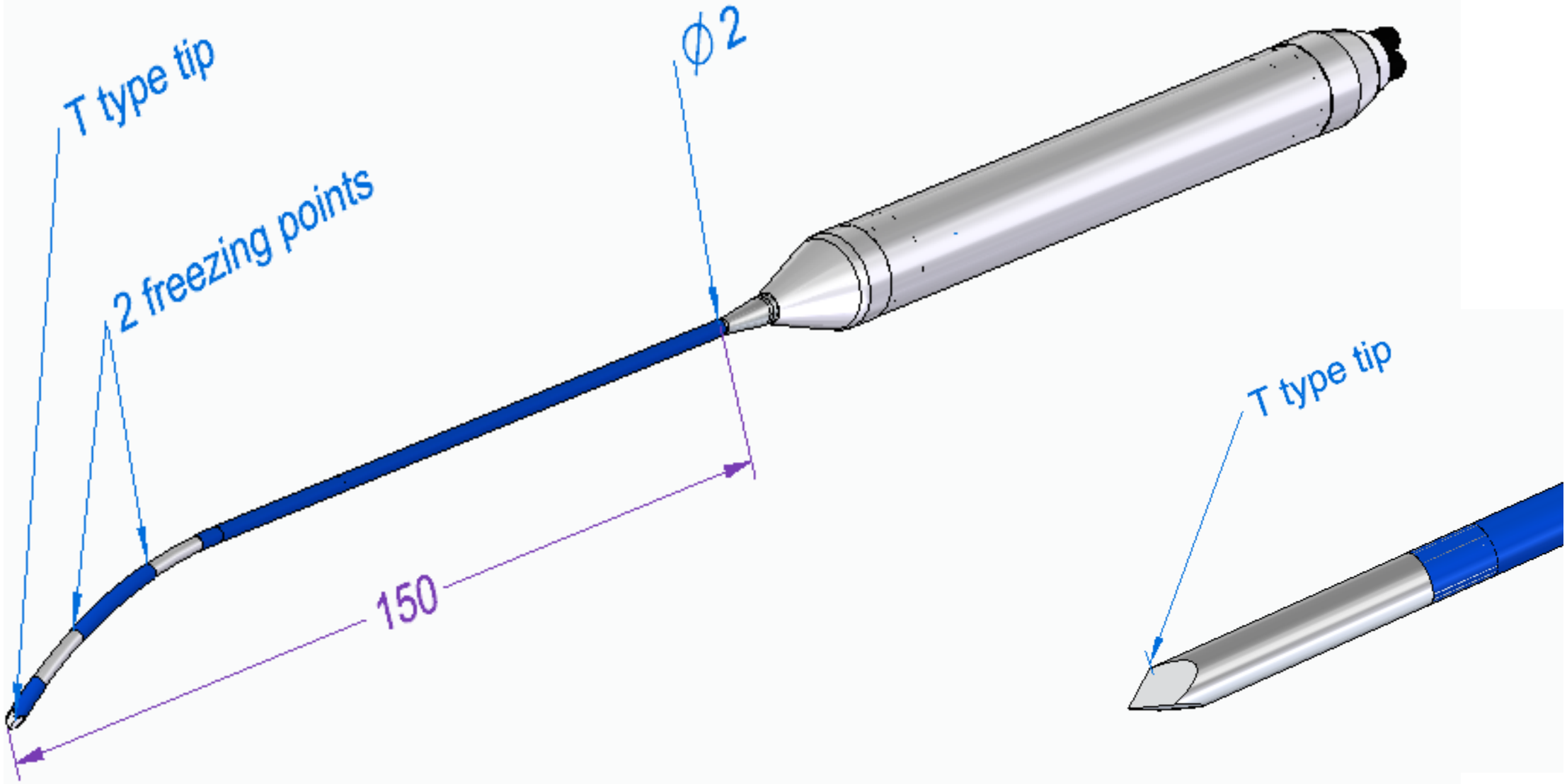
sacroiliac joints ∅ 2mm /L: 150mm/ triangular tip



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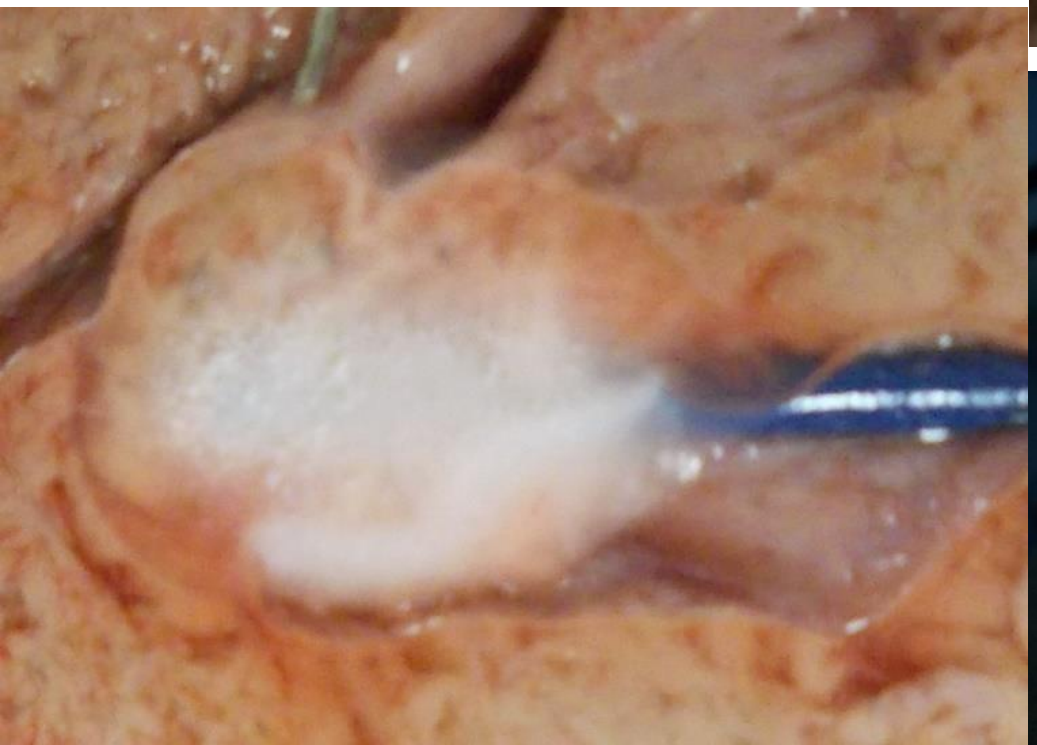
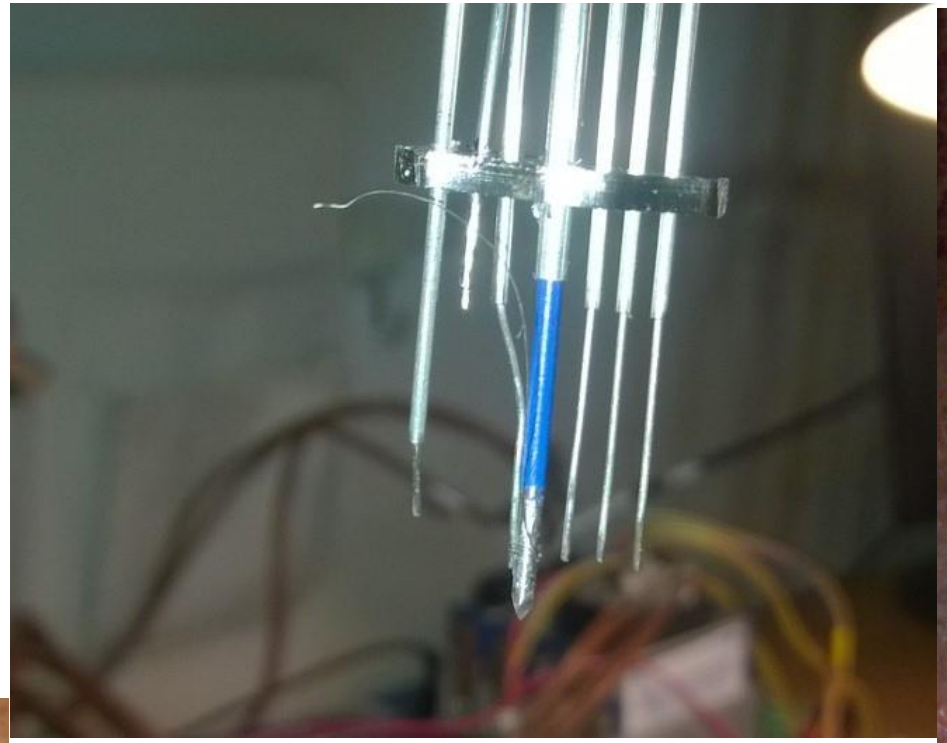
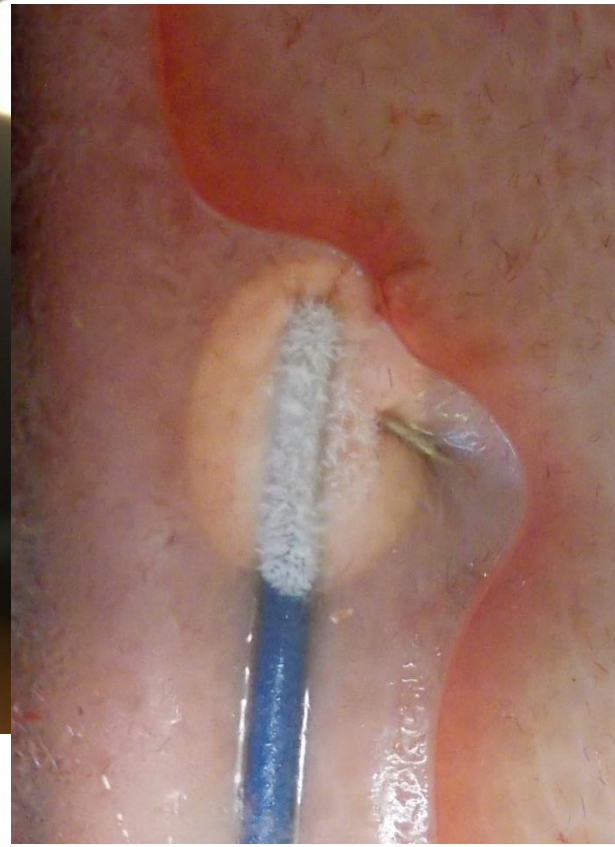
In vitro analysis method







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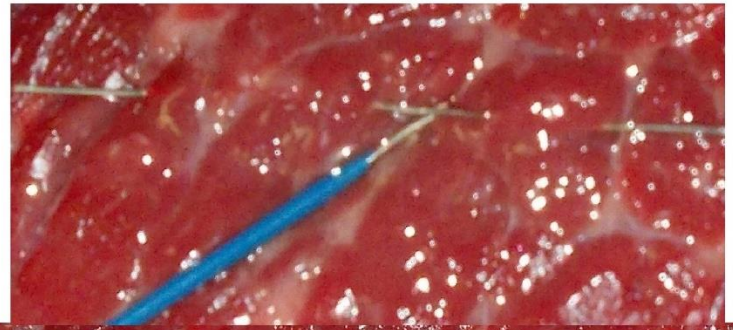
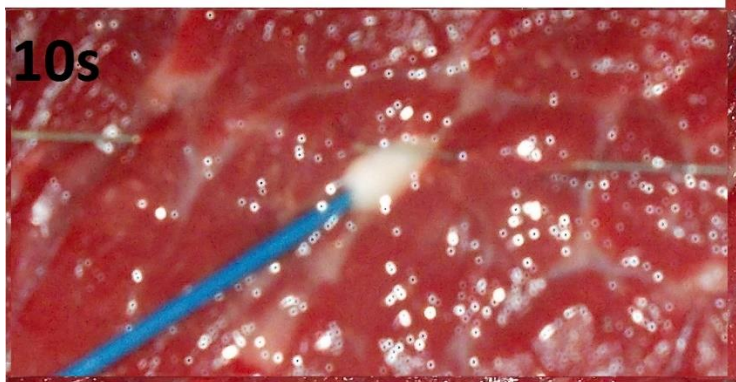
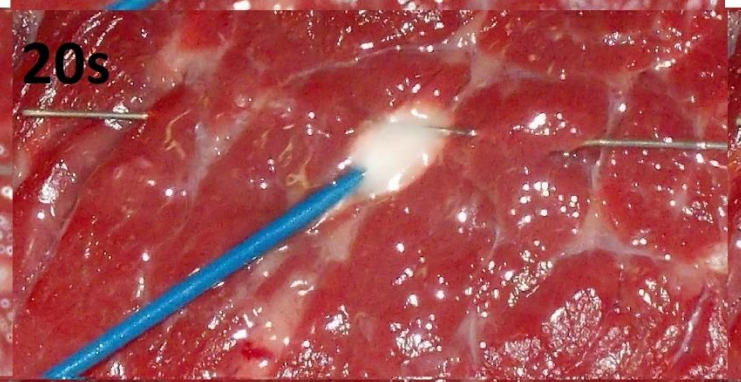
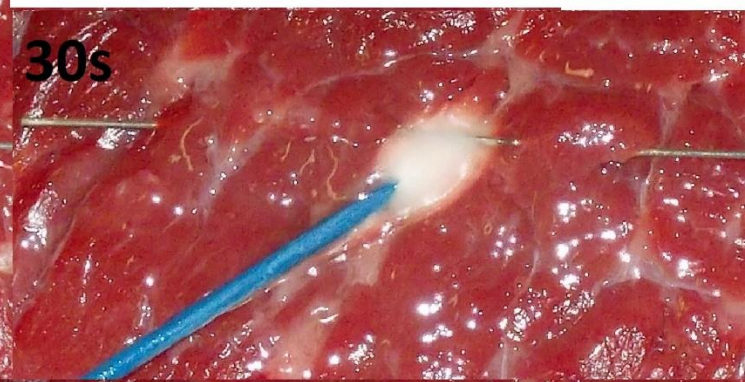
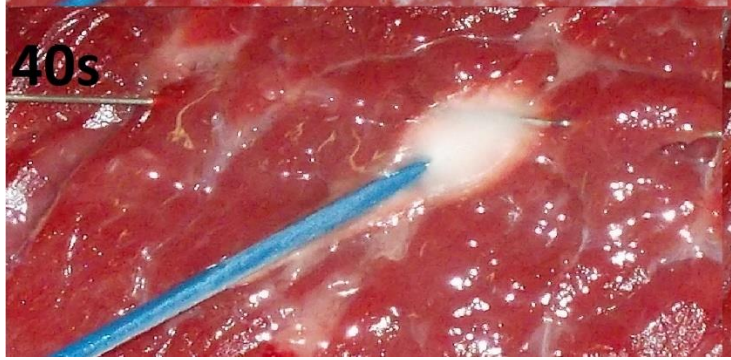
Start:

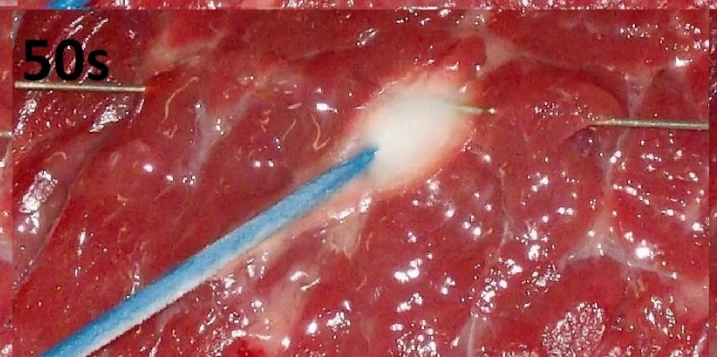


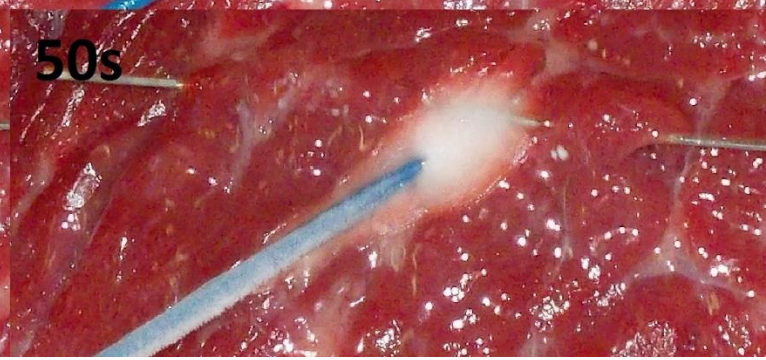












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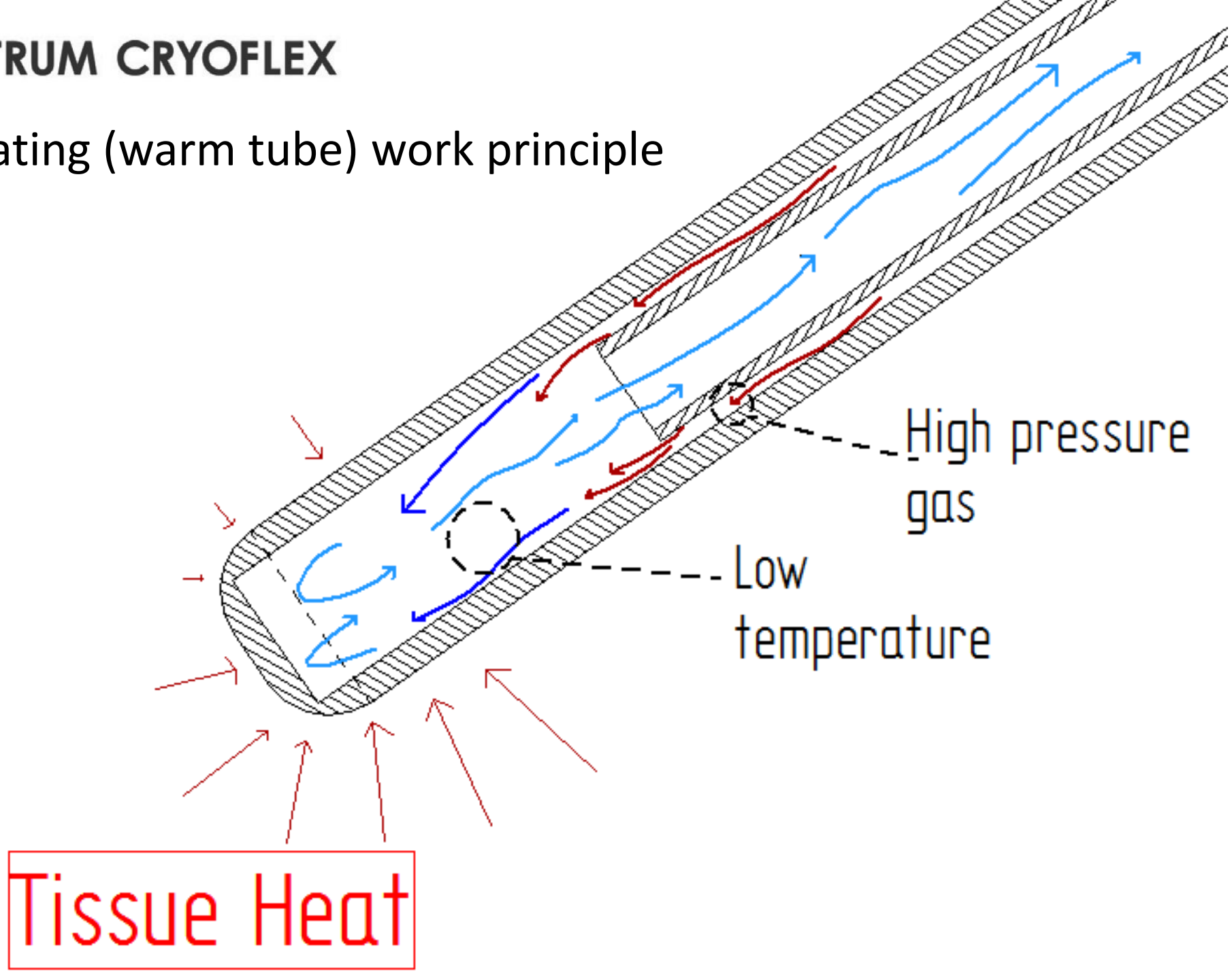
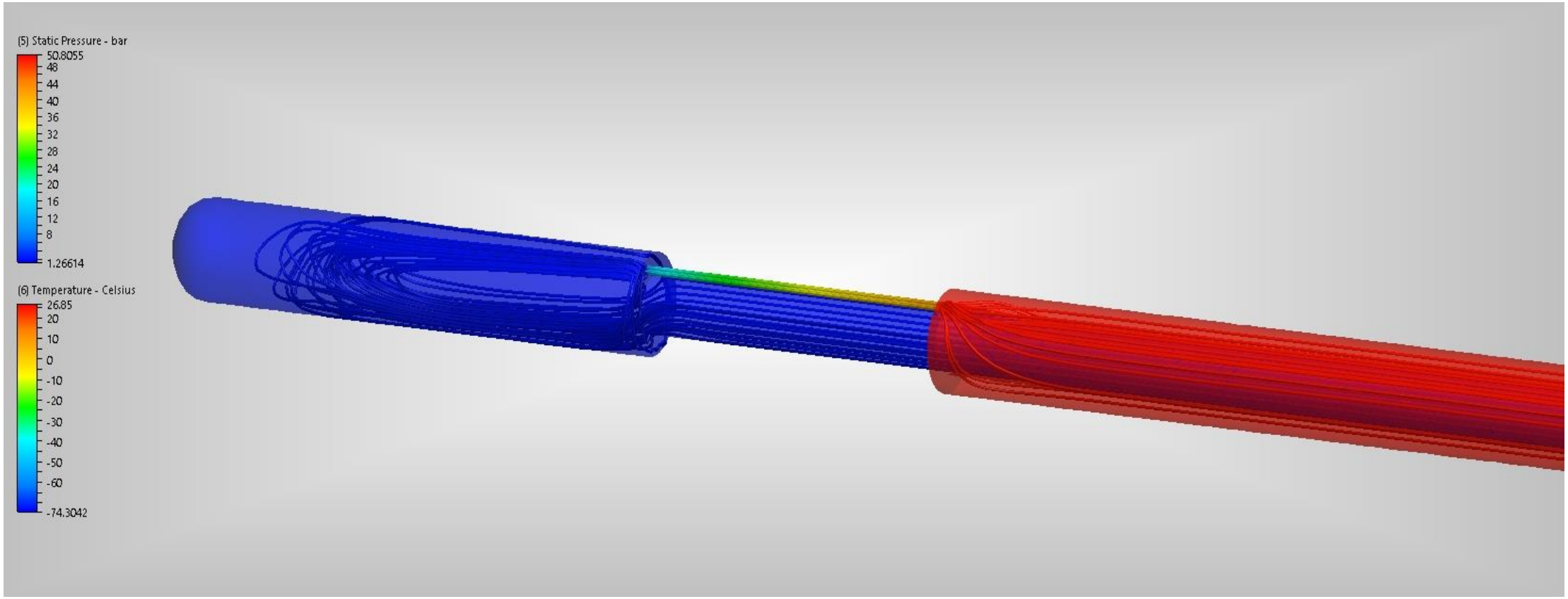
Internal coating (warm tube) work principle



CFD Simulation of internal coating (warm tube) cryoprobe using CO_2



In vitro test result and visualization

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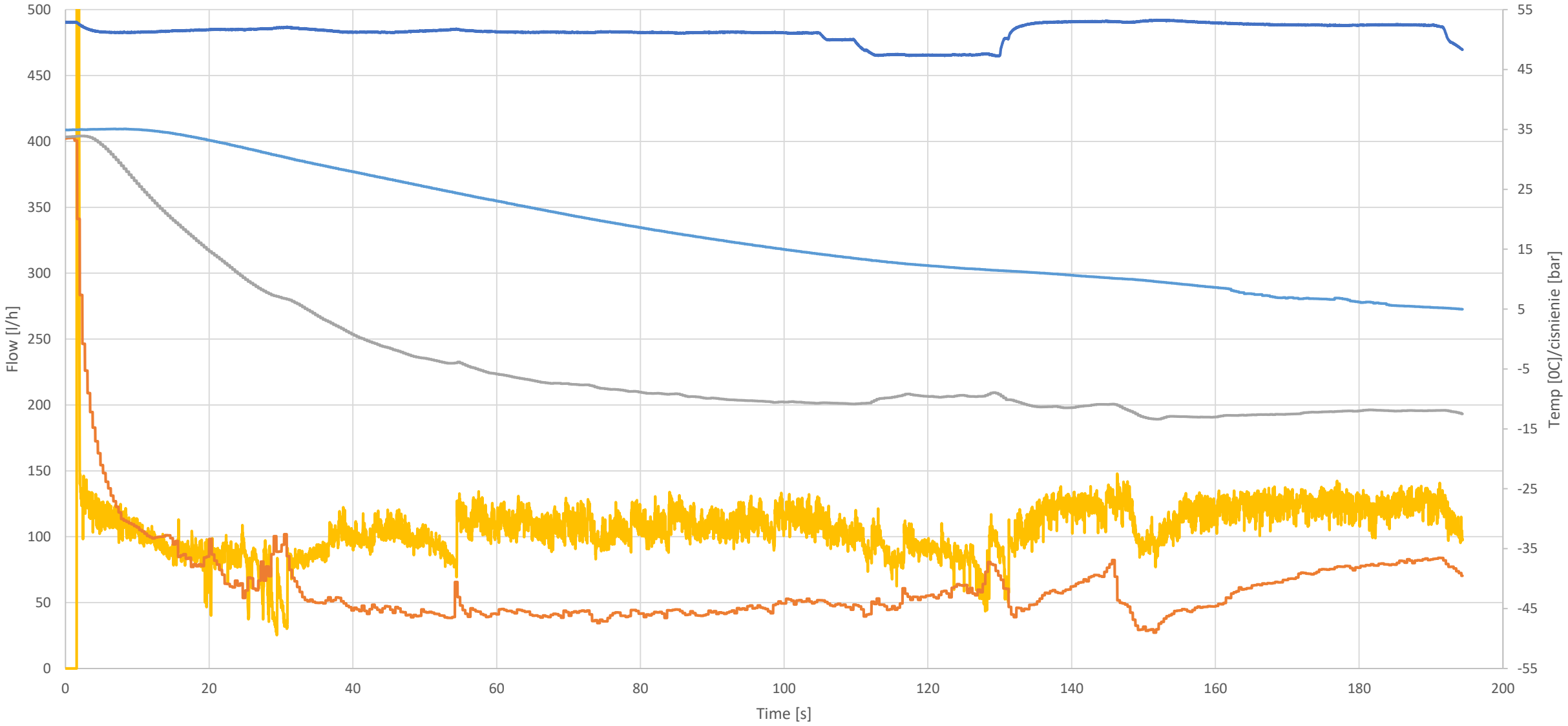
∅ 0,8mm /L:20mm/needle tip

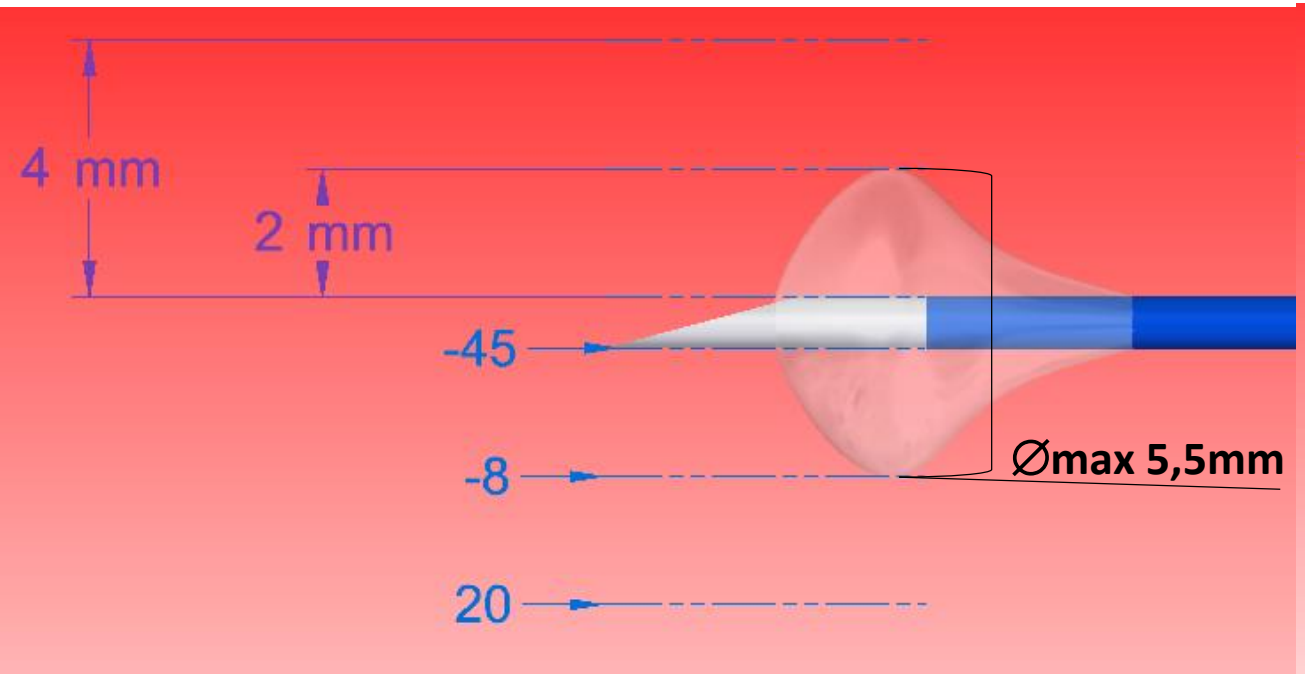
Start pressure: 63[bar]

environment: agar 35^{0}C

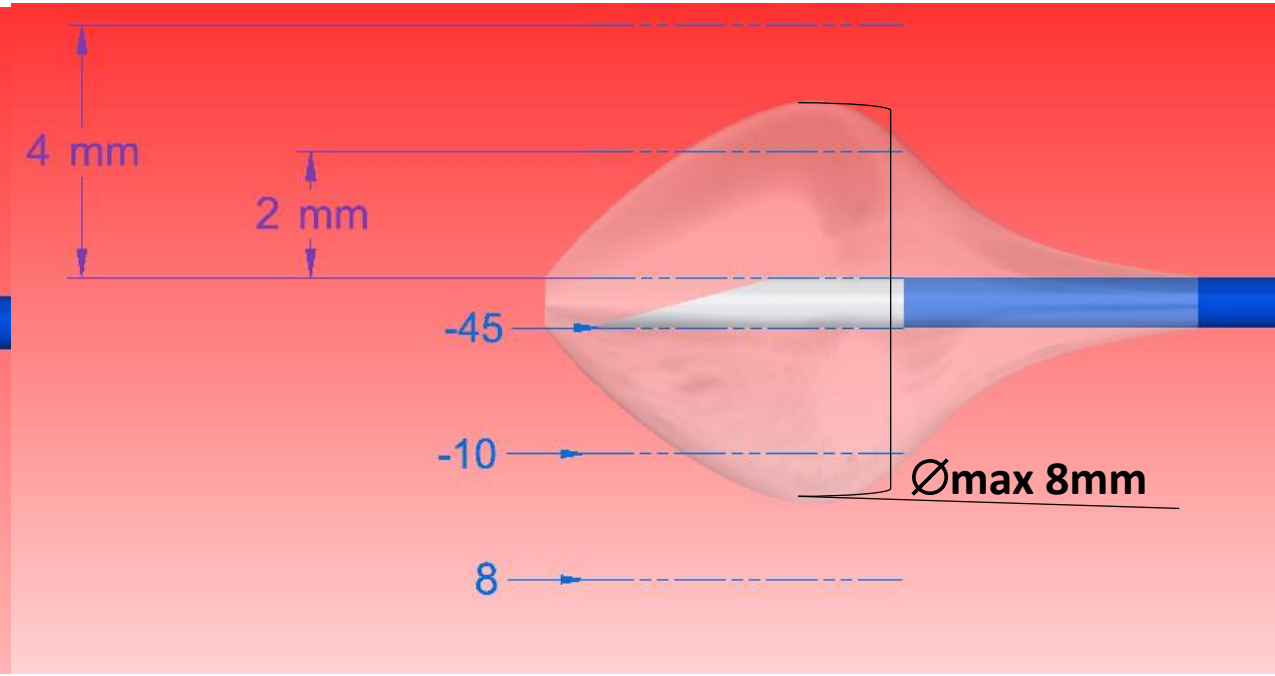


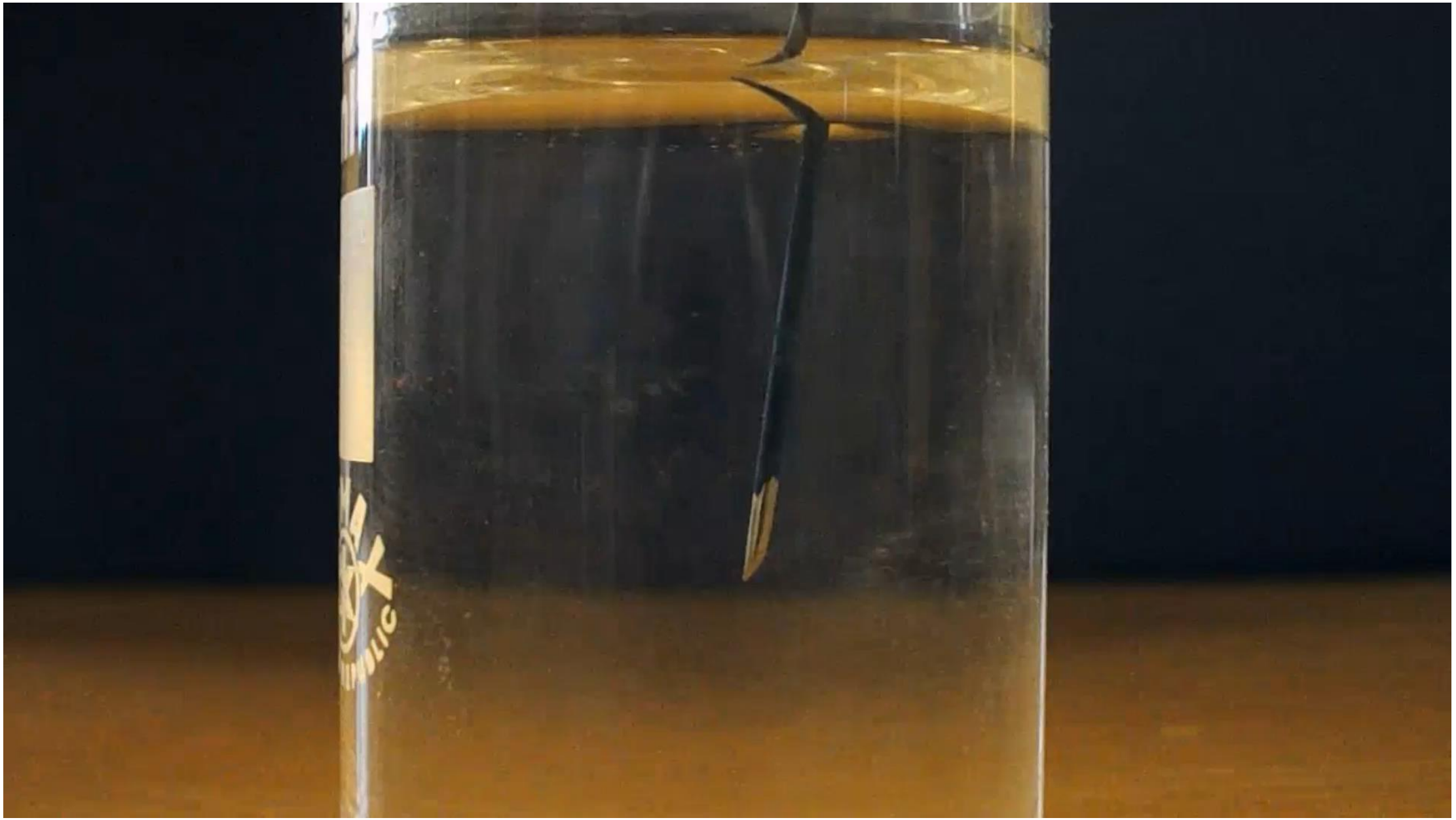
Increase of frozen area during the in vitro treatment with Ø0,8mm needle tip cryoprobe.

1 min



2 min





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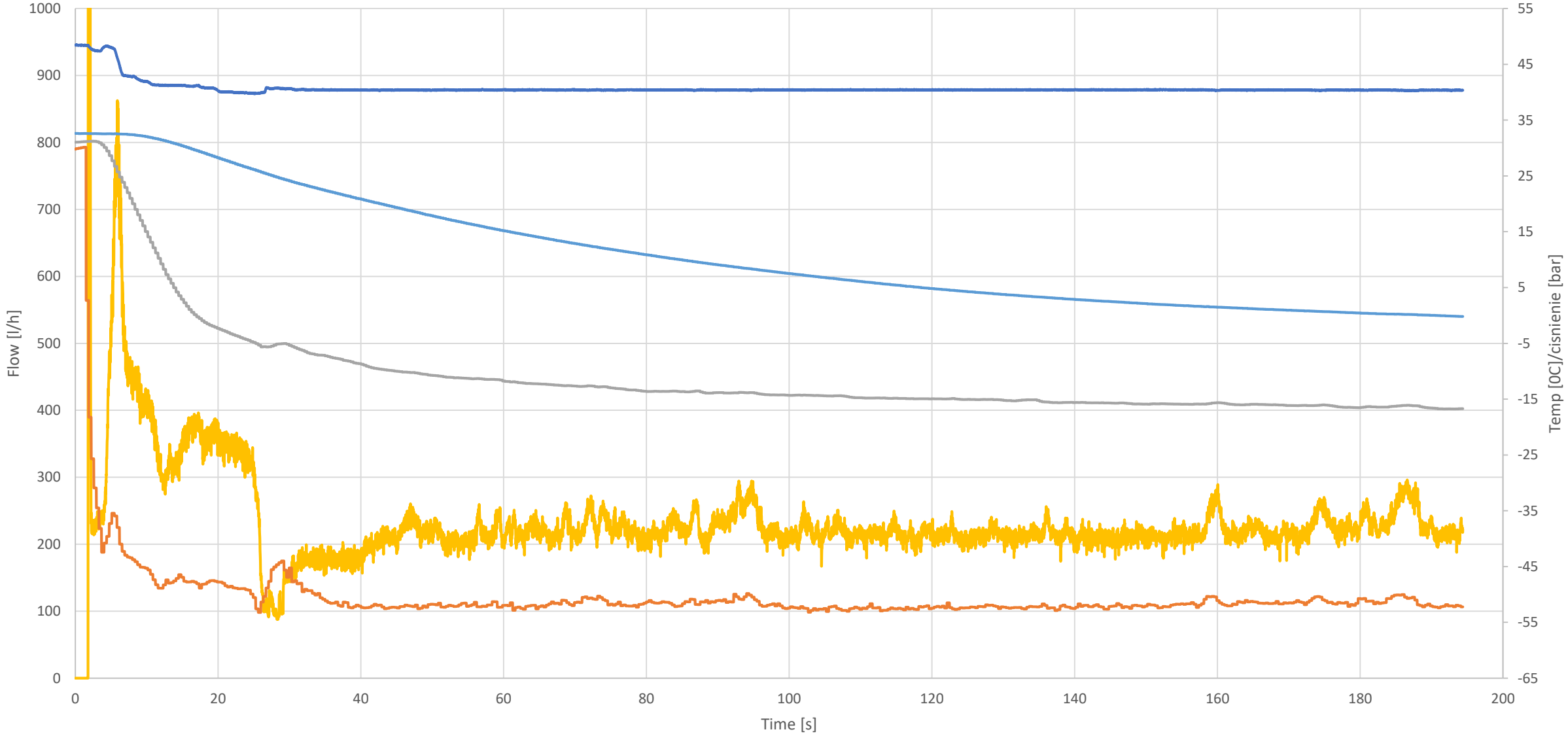
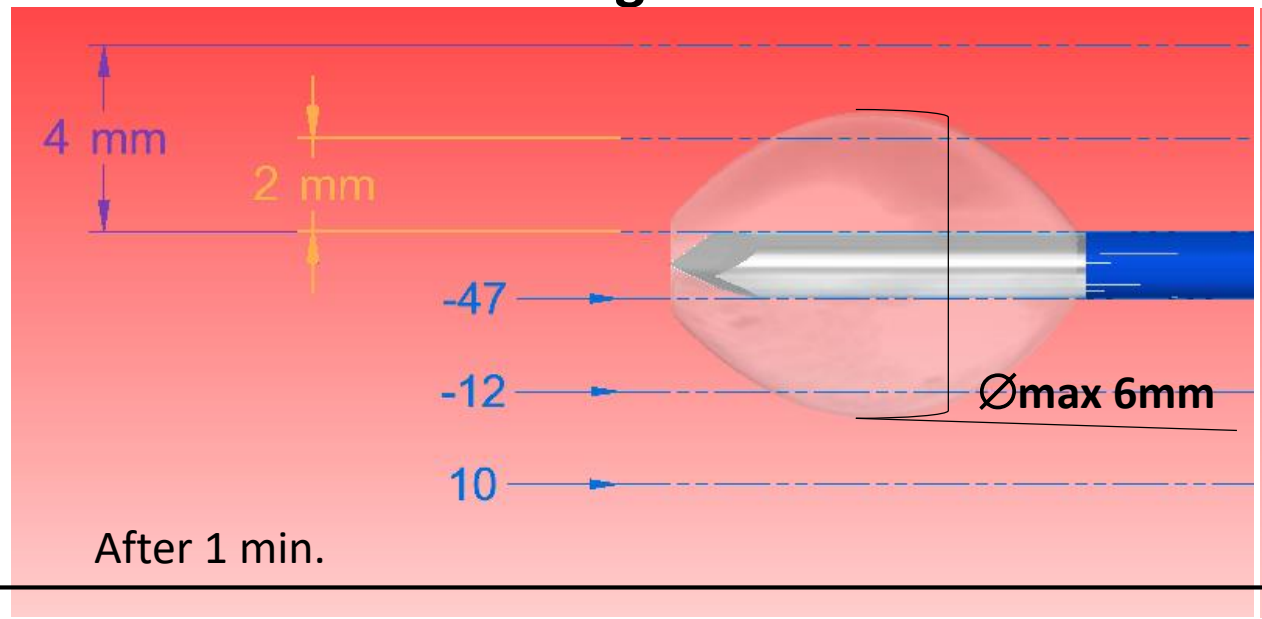
∅ 1,3/L: 120mm
Start pressure: 50[bar]
environment: agar 35^{0}C



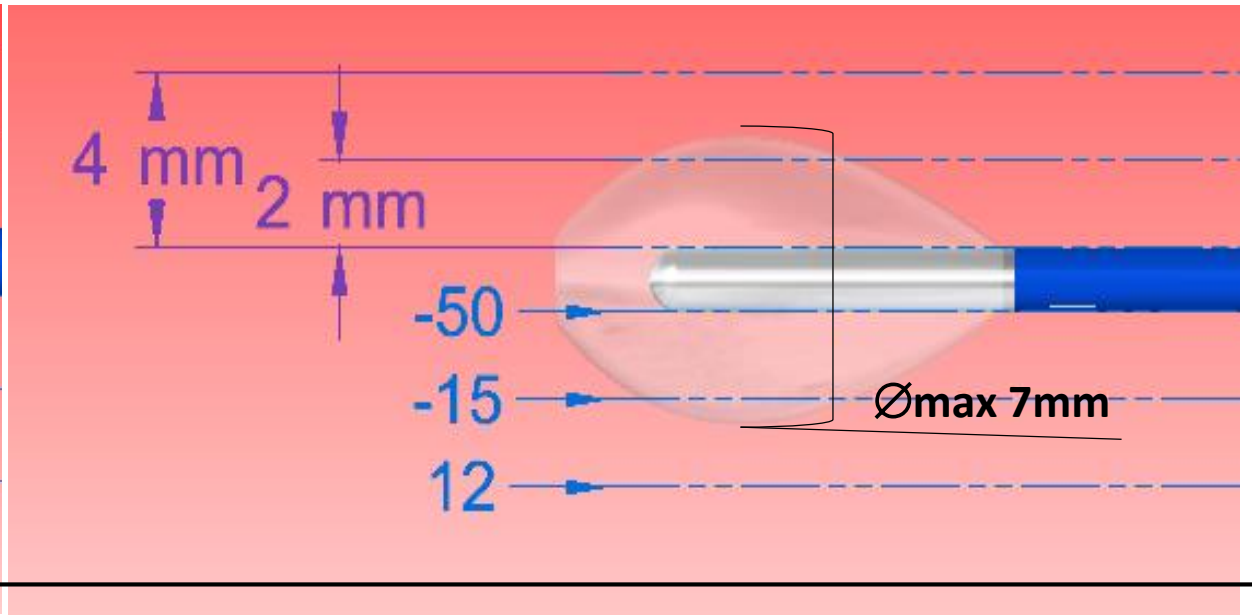
Ø 1,3/L: **120mm** tip type comparison

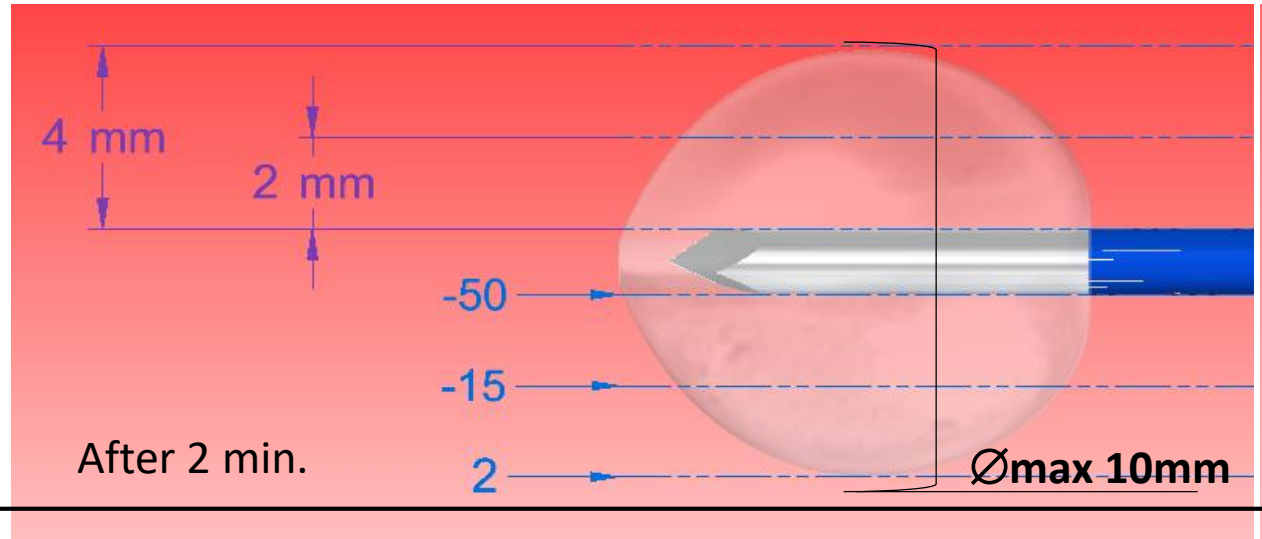
Triangular



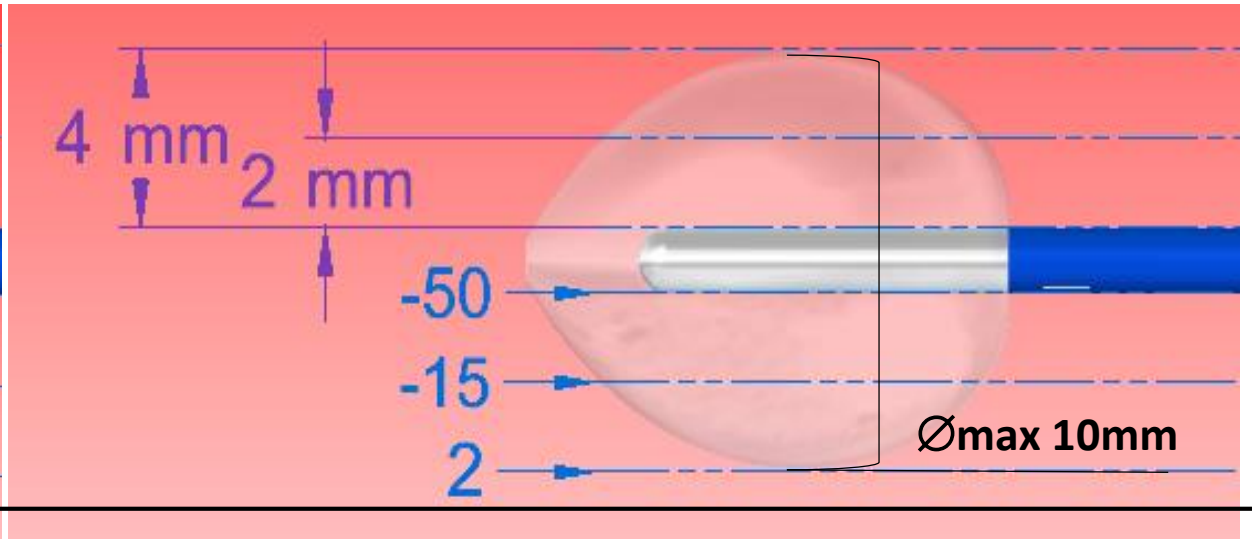
After 1 min.

Radius





After 2 min.



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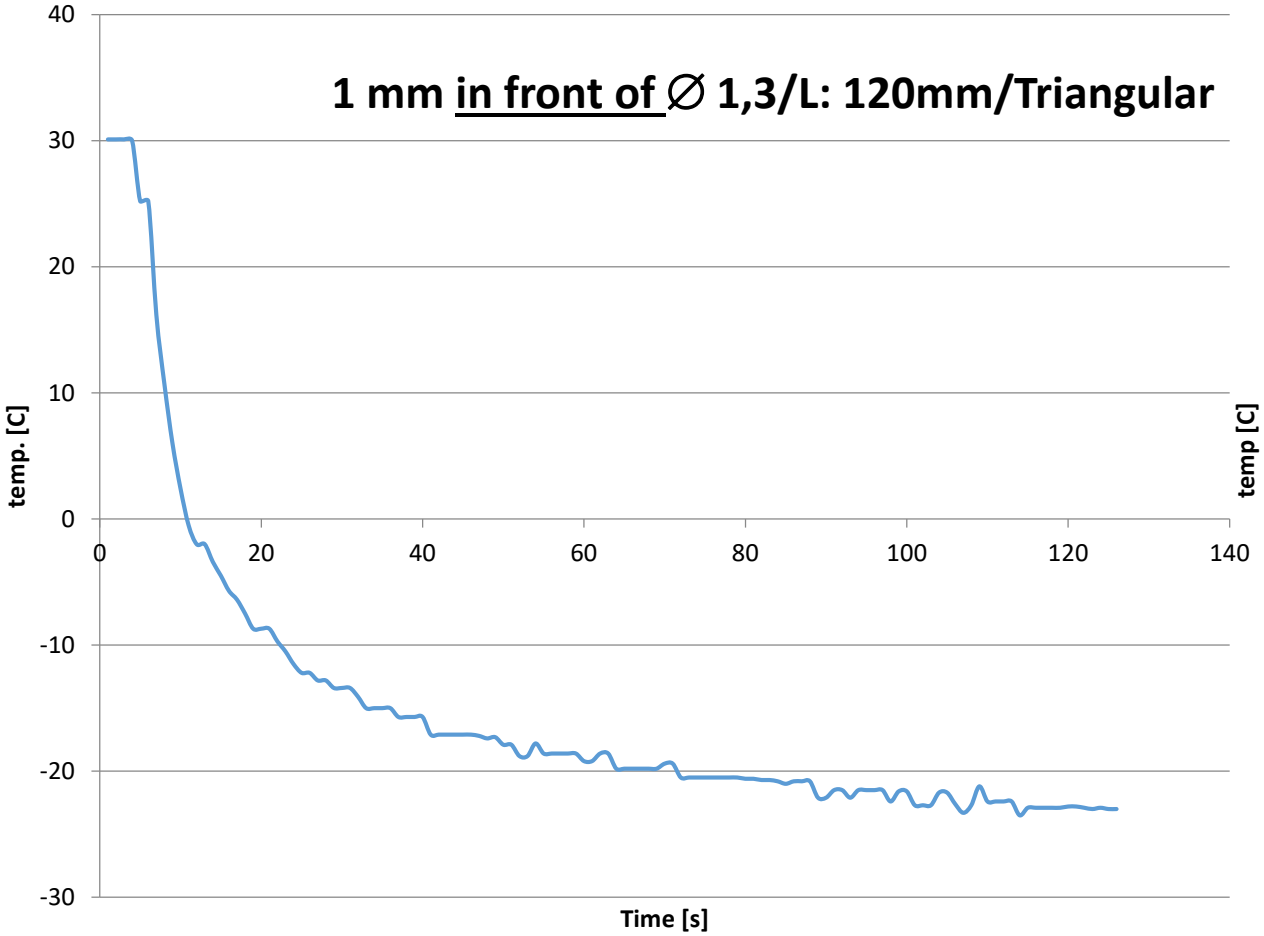
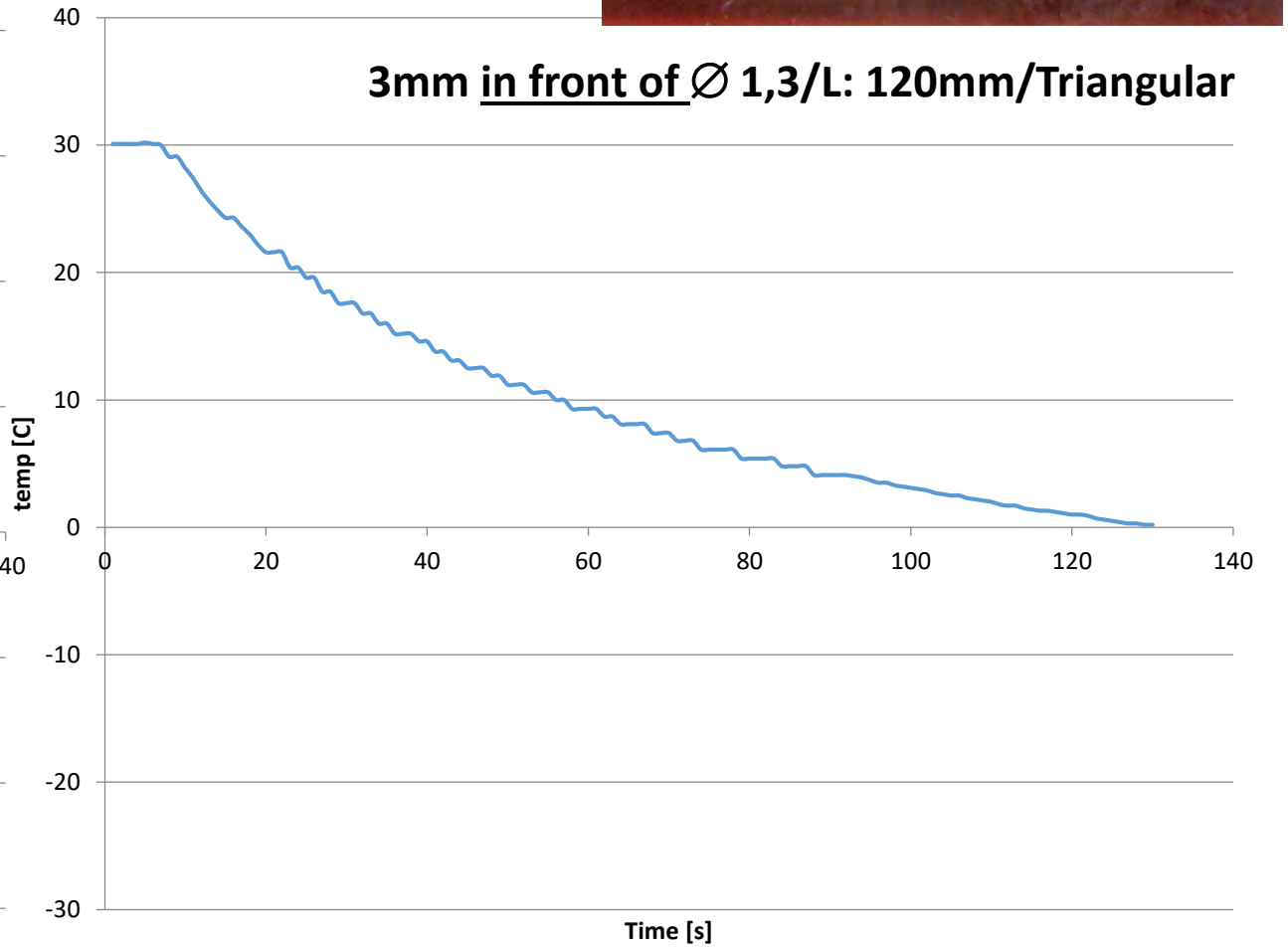
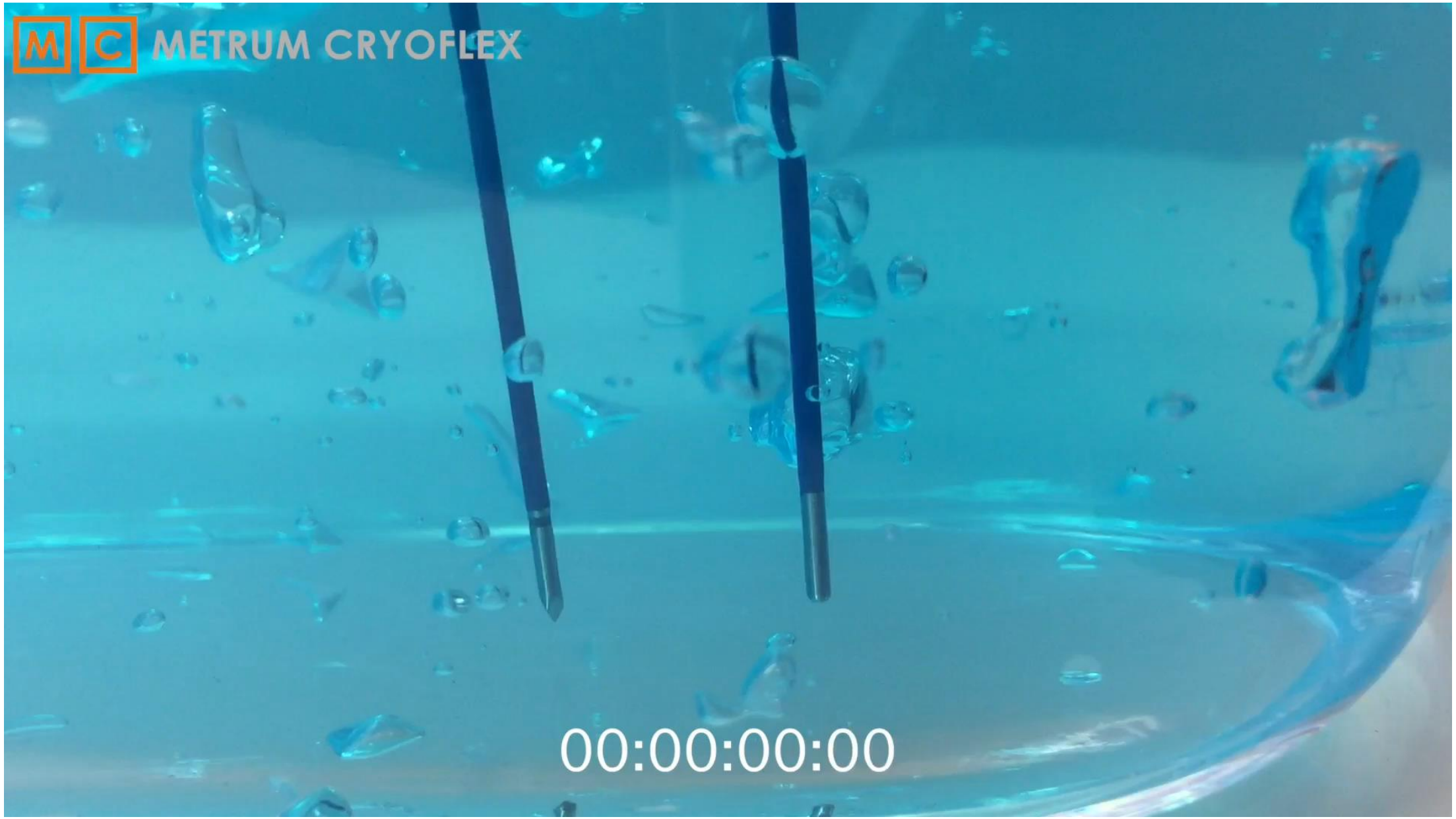
Axis direction heat transfer






METRUM CRYOFLEX
00:00:00:00

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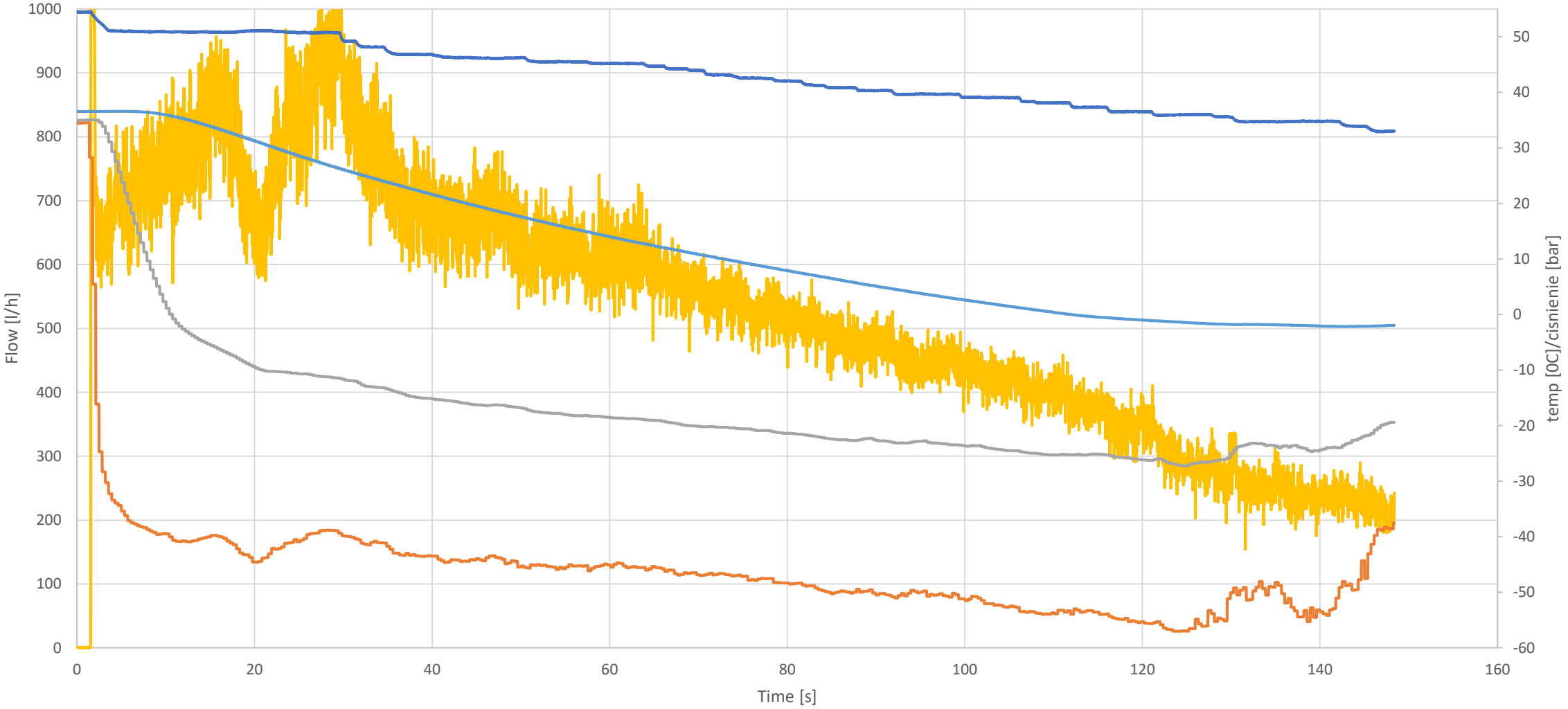
∅2mm/L: 150mm

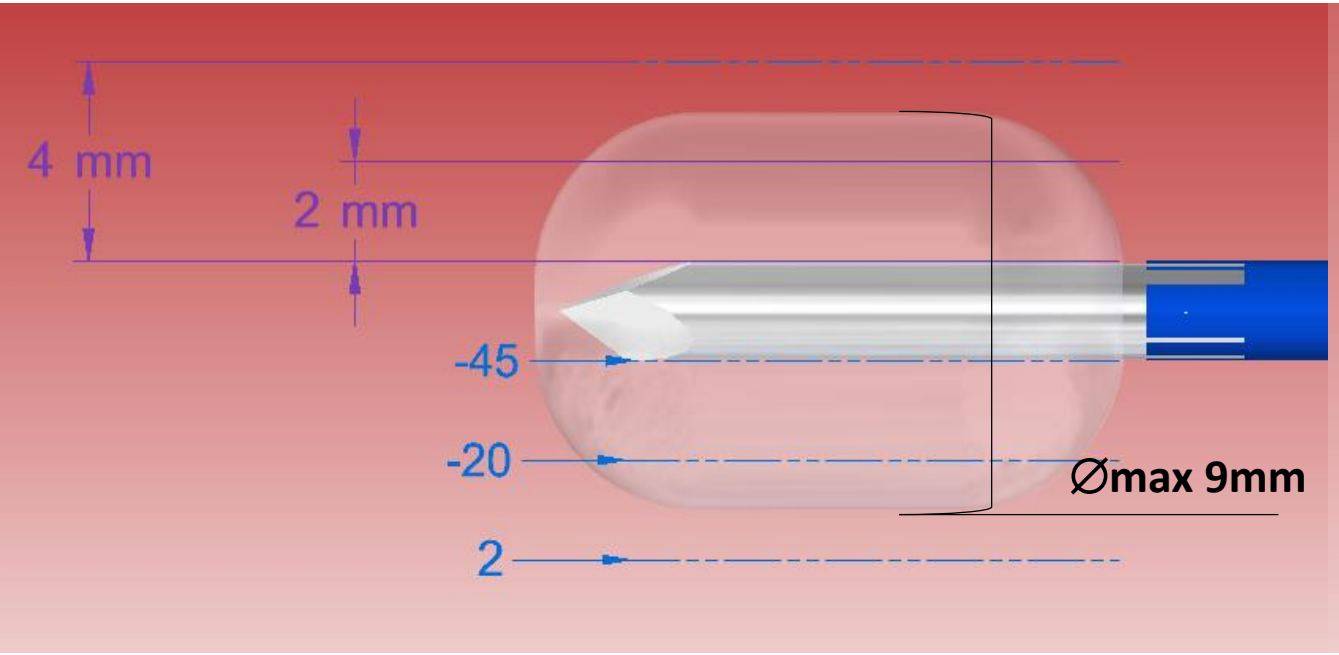
Start pressure: 50[bar]

environment: agar 35^{0}C

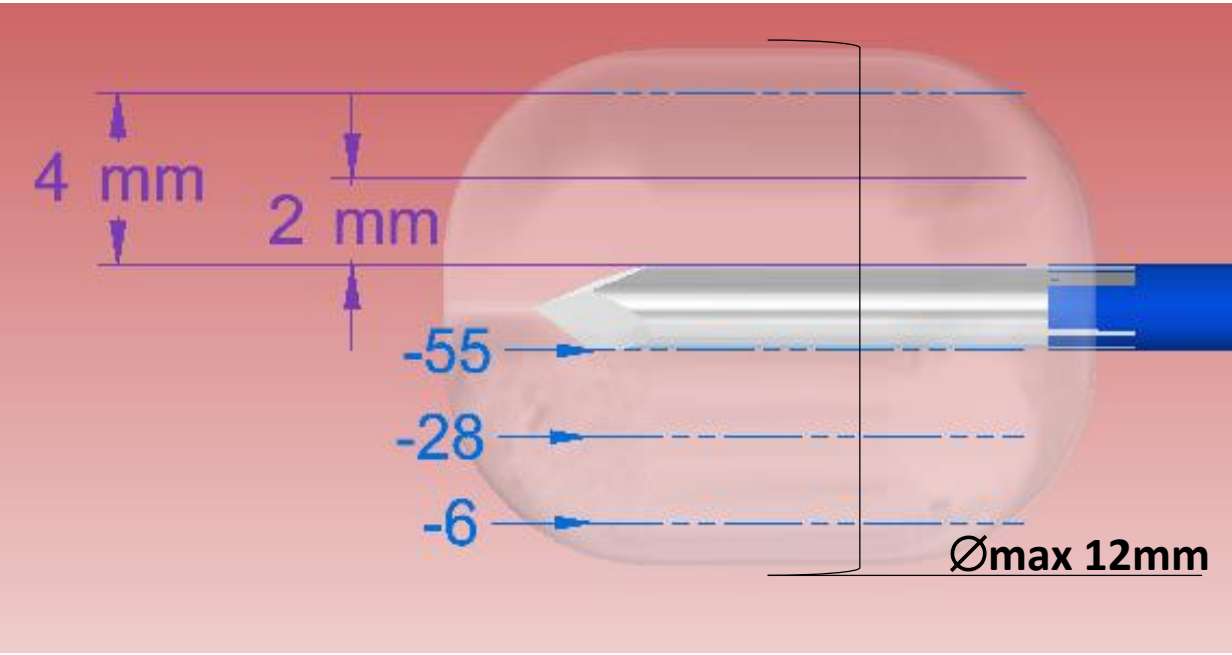


Increase of frozen area during the in vitro treatment in ∅2mm/L: 150mm cryoprobe.

1 min

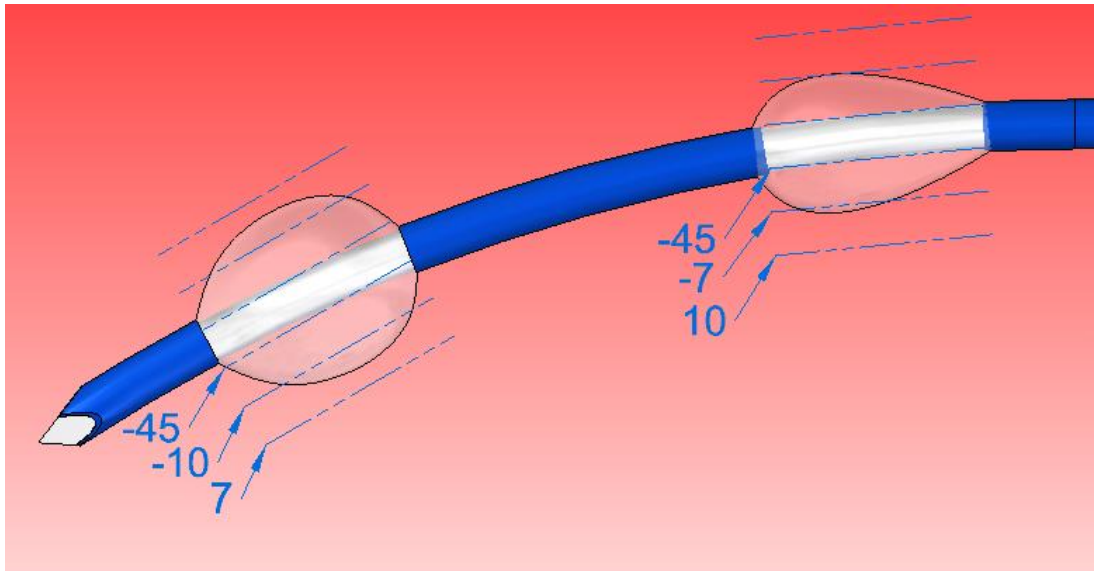


2 min

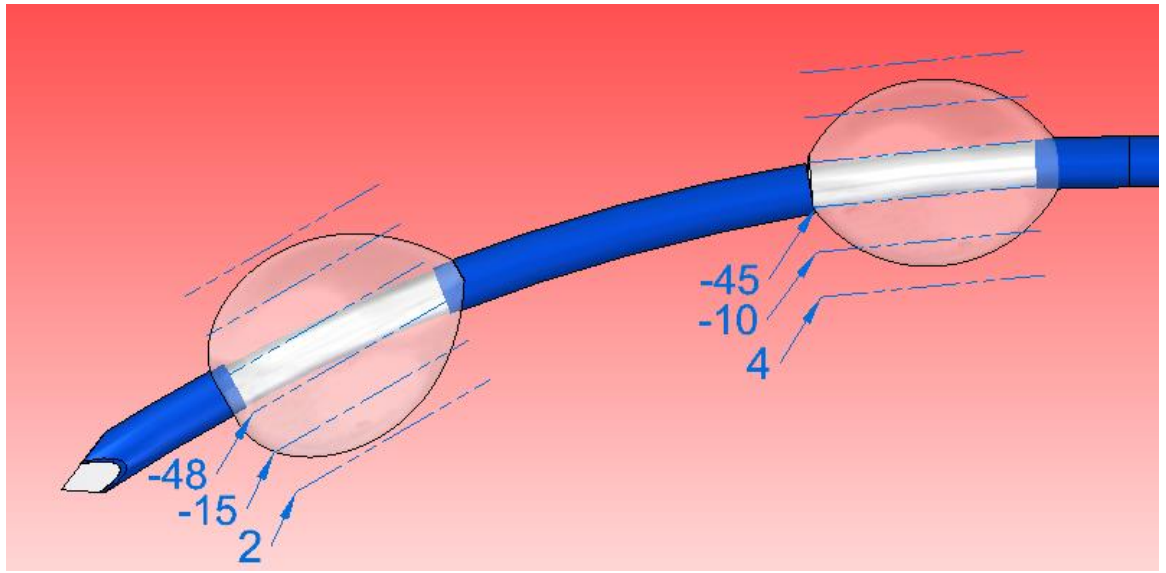


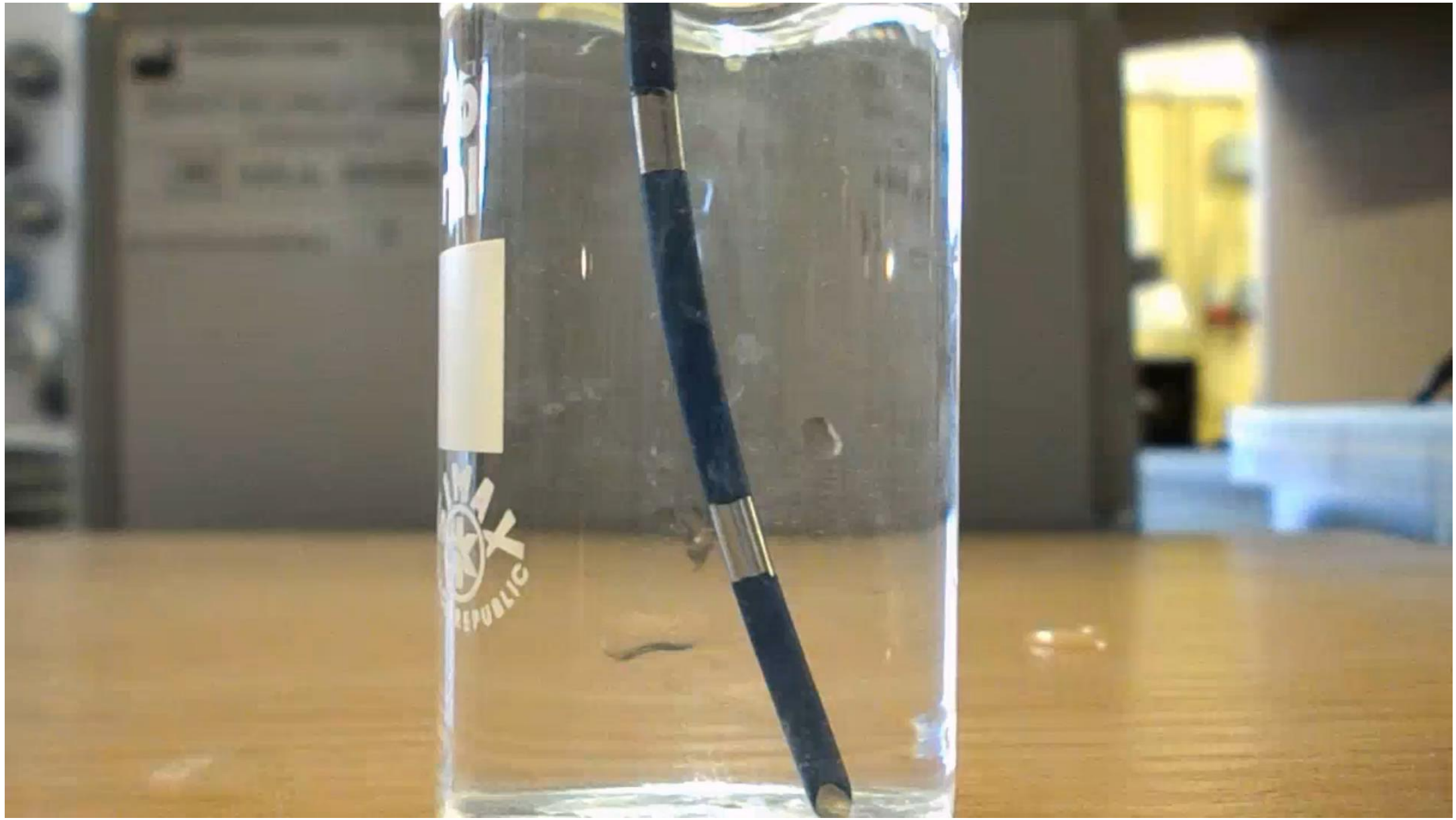
Increase of frozen area during the in vitro treatment in sacroiliac joints ∅ 2mm /L: 150mm cryoprobe.

1 min



2min





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Conclusions

- To avoid skin damage using 0,8mm probe, use cannula.
- For axial freezing (nerve in front of probe) use round tip probes
- Using triangular tip probes, the lowest temperatures are on side of probe
- Time of treatment depends on nerve positon against the probe.

Thank you for attention